

BOLIVIA

By Pablo Velasco and Steven T. Anderson

The Republic of Bolivia, which is located in central South America southwest of Brazil, has an area of about 1,098,580 square kilometers. In 2002, the population was about 8.6 million (U.S. Central Intelligence Agency, 2002§¹). The nominal gross domestic product (GDP) was about \$8.1 billion,² and GDP per capita was just over \$1,010 in terms of current (2002) prices (International Monetary Fund, 2003a§, b§). On the basis of economic data from the Instituto Nacional de Estadística (INE), the Dirección de Estudios Económicos of the Fondo Latinoamericano de Reservas (FLAR) reported that real GDP expanded modestly by 2.8% in 2002 compared with 1.5% in 2001 in constant 1990 bolivianos. The expansion was mainly owing to a recovery in investment that was driven by projects related to the construction of two new gas pipelines and an increase in public expenditure. Construction of the San Matías-Cuiaba and Yacuiba-Rio Grande gas pipelines was projected to require an estimated investment of about \$400 million during the next 3 years. Production of crude oil and natural gas continued to expand strongly in 2002 in response to higher domestic and foreign demand (Fondo Latinoamericano de Reservas, 2003§).

The shift within the Bolivian mineral industry toward more hydrocarbon production and away from the production of other minerals, as a percentage of the GDP, has been consistent during the past 5 years owing, in part, to low international metal prices, limited mining investment, and local disputes that have interrupted production (Fox, 2003). The production of metallic and nonmetallic minerals contributed 5.3% of the value of the real GDP in Bolivia in 1997 but only 4.3% in 2002. Meanwhile, the production of hydrocarbons contributed 4.4% of the value of the real GDP in 1997 and 5.1% in 2002 (Instituto Nacional de Estadística, 2004c§). These trends, which were expected to continue into 2003, were even more striking in the composition of the mineral exports of Bolivia (Fox, 2003).

The Bolivian construction sector recorded the highest growth in 2002 (14.3%) compared with other sectors owing, in part, to the construction of the two new gas pipelines. Accordingly, the crude oil and natural gas sector also expanded significantly (6.5%) (Fondo Latinoamericano de Reservas, 2003§). In 2002, Bolivia worked to increase joint energy projects with Brazil because the countries share an extensive border and a large gas pipeline. The main market of common interest for the two countries was the purchase and sale of natural gas. A secondary concern within the energy sector was the codevelopment of value-added projects, such as the construction of thermoelectric powerplants, the production of petrochemicals and fertilizers for export, and the manufacture of about 100,000 barrels per day (bbl/d) of gas liquids to improve transportation (Alexander's Gas & Oil Connections, 2003).

According to the American Chamber of Commerce in Bolivia, Bolivia has traditionally been a mining country that produced antimony, bismuth, copper, gold, lead, silver, tin, tungsten, and zinc. It has large reserves of gold, iron ore, lithium, natural gas, and petroleum. In 2002, the most important development in the traditional mining sector was the depletion of reserves at the Kori Kollo gold mine. Kori Kollo had been the biggest gold mine in South America and produced 3.2 million troy ounces of gold during its productive life. At one time, Kori Kollo accounted for 8% of Bolivia's exports. Bolivia has untouched reserves of antimony, gold, iron, lead, lithium, silver, tin, and zinc (Amcham Bolivia, 2004§).

Structure of the Mineral Industry

At the end of June 2002, inconclusive public presidential elections were held before Congress elected a new President in August; the new President had attracted only 22.5% of the popular vote during the general election. The President was the most successful mining entrepreneur in Bolivia, and his family owned the private mining company Compañía Minera del Sur S.A. (COMSUR). The leader of the Movimiento al Socialismo (MAS) opposed the operations of the free market and cooperation with the United States on drug eradication programs and reportedly polled almost 21% of the popular vote. In 2002, the Bolivian Government did not hold a strong mandate and the level of civil unrest was high. Demonstrations, road blockages, and strikes in many sectors of the Bolivian economy, which included aggressive support of strikes among miners, severely disrupted mining production in 2002 (Fox, 2003).

The structure of governance and Government support of the mining industry was under review by the new Government at the end of 2002. The hydrocarbons sector, which continued to be one of the fastest growing sectors of the Bolivian economy, required an increasing amount of attention. The Viceministerio de Energía e Hidrocarburos (VEH) set policy for exploration, development, and production in the hydrocarbons sector and oversaw enforcement of these policies. The Superintendencia de Hidrocarburos was responsible for the downstream sector, including pipelines and other aspects of distribution. Similar to the governance structure for the nonhydrocarbon mining sector, companies gain access to the Bolivian natural gas transportation system through concessions; firms are not awarded exclusivity rights to geographic areas. Prices for domestic natural gas are set by the Government (U.S. Department of Energy, 2003§). Yacimientos Petrolíferos Fiscales Bolivianos (YPFB) was once the state oil company of Bolivia. Through the gradual privatization of its assets and operating divisions since 1994, YPFB has assumed a secondary role as a regulator of

¹References that include a section mark (§) are found in the Internet References Cited section.

²Where necessary, values have been converted from bolivianos (\$b) to U.S. dollars at the rate of \$b7.17=US\$1.00.

exploration, production, refining, and transportation operations. In 2002, YPFB was the administrator of international negotiations and of contracts with foreign oil companies (U.S. Energy Information Administration, 2002).

The Viceministerio de Minería y Metalurgia (VMM) and the VEH were branches of the Ministerio de Desarrollo Económico in 2002. The VMM was legally responsible for formulating mining policy for the nonhydrocarbon mining sector's development. It provided investors with the necessary information about the rights and guarantees of mining concession holders, tax and mining laws, and environmental regulations for mining. It controlled and participated in the mineral industry mainly through Corporación Minera de Bolivia (COMIBOL), the Instituto de Investigaciones Minero Metalúrgicas (IIMM), the Servicio Nacional de Geología y Minería (SERGEOMIN), and the Servicio Técnico de Minas (SETMIN), as well as through other autonomous Government agencies (U.S. Commercial Service, 2004).

COMIBOL, which was the country's leading mining producer until the 1980s, has royalty rights that have been guaranteed in the Bolivian constitution to any formerly state-owned mines or mining properties that are renewed and brought back into production. In general, mining concessions in Bolivia confer the right to exploit minerals, but ownership of all mineral substances on the surface or underground remain the property of the Bolivian Government (U.S. Commercial Service, 2004). In 2002, COMIBOL also had the power to intervene wherever management contracts were altered or in dispute. By 2002, the incentives to simply collect royalty payments, a steady historic decrease in the economic viability of mines under state control, and pressure from international financial lenders to privatize allowed COMIBOL to become primarily a holding company. COMIBOL only administered and rented formerly nationalized mining properties through fixed-period exploration and exploitation joint-venture contracts for almost all of 2002. A production role for COMIBOL, however, was revived at the end of 2002 (Fox, 2002, 2003).

Hampered by the royalty payments that it requires, COMIBOL continued to find it difficult to complete joint-venture contracts for its three main assets—the Cerro Rico de Potosí silver deposit, the shuttered Karachipampa lead-silver smelter, and El Mutún iron and manganese deposit. High infrastructure development costs have long hampered the sale of El Mutún's estimated 40 billion metric tons of iron ore reserves owing to its location in the remote southeastern part of the country (Fox, 2002, 2003). The Karachipampa smelter has been dormant since its construction by a German/Belgian consortium in 1983 primarily owing to a lack of appropriate feed for the Russian-developed Kivcet flash-smelter furnace. The Karachipampa smelter was to be used to aid in the processing of the potential output of Apex Silver Mines Ltd.'s San Cristobal zinc-silver project (U.S. Commercial Service, 2004). At the end of 2002, neither project financing nor agreement on who would build the necessary infrastructure to complete the project was in place (Apex Silver Mines Limited, 2003, p. 7-10).

In 2002, the revival of a production role for COMIBOL was closely tied to its role in the governance structure of the Bolivian mining sector. In May 2002, COMSUR's majority-owned joint-venture company Cía. Minera Colquiri S.A. (CMC) (COMSUR, 51%, and Commonwealth Development Corporation Capital Partners Plc., London, United Kingdom, 49%) purchased the Vinto tin smelter and the Huanuni tin mine from RBG Resources Plc. of London, United Kingdom. In 1999, the Vinto smelter was sold by the state-run smelting firm Empresa Metalúrgica Vinto S.A. (EMV) to Allied Deals Plc (the name of RBG Resources until 2001) because EMV reportedly did not reinvest a sufficient amount to maintain the productive capacities of the smelter, which caused pressure from international lenders and COMIBOL to privatize it. In 2000, COMIBOL also granted Allied Deals a 30-year contract to operate the Huanuni Mine as part of its bid to purchase the Vinto smelter. At that time, Allied Deals agreed with COMIBOL to reinvest \$10 million in the Vinto smelter and \$10.25 million in the Huanuni Mine during the first 5 years of the contract. The 2002 sale of these Bolivian properties was a result of a wider liquidation of RBG Resources following the disclosure that large sums of money were missing from company accounts. COMIBOL investigated and then intervened in November 2002. COMIBOL suggested that RBG Resources had failed to reinvest sufficiently in the Huanuni Mine, thus limiting the mine's production capacity and subsequent royalty payments to COMIBOL based on that capacity. Also, RBG Resources reportedly reinvested only \$2 million in the Vinto smelter. CMC agreed to reinvest the additional \$8 million in the Vinto smelter and was allowed to operate the smelter for the remainder of 2002. COMIBOL, however, directly managed the Huanuni Mine during the last 2 months of 2002 while seeking a new partner to run the mine under another shared royalty agreement. COMIBOL claimed that the Huanuni Mine turned a \$200,000 average monthly loss incurred during its management by RBG Resources into a \$200,000 monthly profit under COMIBOL management (Fox, 2003).

Small-scale mining entities and cooperatives make up another important component of the Bolivian mineral industry. A total of 506 mining cooperatives were grouped under the Federación Nacional de Cooperativas Mineras (FENCOMIN), and membership continued to grow steadily with 45,302 miners registered in 2001 and more in 2002. In contrast, the number of noncooperative small-scale mines has been steadily decreasing since the 1970s with only about 350 operating mines and 3,500 miners working in those mines (U.S. Commercial Service, 2004). Many small-scale miners were previously employed by COMIBOL but they have been steadily released into the private sector since about 1985. The Huanuni Mine, which was the last of COMIBOL's functioning mining assets, was transferred to the private sector in 2000 (Bocangel, 2001\$). In 2002, for example, the approximately 2,000 members of the Posokoni Cooperative worked the upper levels of Huanuni Mine and held demonstrations where they demanded access to the lower levels, which were still being developed by the owners (Fox, 2002).

Such mining cooperatives and small-scale mines have often been considered to be inefficient by the standards of much larger mining companies. For example, about 57% of Bolivia's tin production came from the small-scale mining sector, but the average peasant miner produced no more than about 200 kilograms per year (kg/yr) of tin-in-concentrates. In support of the small-scale mining sector and as an alternative to foreign operation of these mines, which historically has implied replacement of miners with more-modern, mechanized mining technologies, COMIBOL continued to donate the mining equipment from its recently closed mines to cooperatives that were registered with FENCOMIN (Fox, 2002).

In 2002, the Government began implementation of a General Plan of Support to Mining, which included a national emergency mining jobs plan, technical assistance programs for small miners and mining cooperatives, and the incorporation of the mining sector into the National Temporal Import Admission Regimen (RITEEX) under the Economic Reactivation Law. Incorporation into RITEEX allows all imports made within the mining sector to receive a return of the value-added tax (U.S. Commercial Service, 2004). Other goals of this plan were to provide consistent legislation, to promote closer coordination of the cooperatives' production with market demand, to promote diversification, to provide access to finance, and to support greater assistance and training from both governmental and nongovernmental organizations (Fox, 2002).

Officially, small-scale miners who do not belong to a cooperative were associated under the Bolivian Government's Cámara Nacional de Minería (CANALMIN), but a great many more may be working in illegal mining activities (mainly gravel sand and tailings) (Bocangel, 2001§). Of those mining cooperatives registered with FENCOMIN, 376 mined alluvial gold, tin, and tungsten in the Department of La Paz, 109 mined base metals in the Departments of Oruro and Potosí, and 21 mined ulexite and other nonmetallic minerals around the Uyuni Salt Flats. In 2002, all the mineral smelters were privately owned, and production from these smelters was registered as that of "other producers" in Bolivia's statistical records (U.S. Commercial Service, 2004).

In 2002, the medium-scale mining companies were affiliated through the Asociación Nacional de Mineros Medianos (ANMM), whose membership consisted of 12 companies that employed 3,332 people. According to Bolivian Government standards, COMSUR, which operated in the Departments of Oruro and Potosí and produced primarily lead, silver, and zinc in 2002, was a medium-scale mining company, although it would be considered to be quite large in most of the rest of the world. In 2002, 11 other medium-scale mining companies were affiliated with ANMM. Their names and locations and the primary commodities that each company produced are as follows: Andean Silver Corp. (ASC Bolivia LDC), Uyuni (lead, silver, and zinc); Cía. Minera Concepción S.A., Potosí (metallic silver); CMC, Potosí (tin and zinc); Complejo Metalúrgico Vinto S.A., Oruro (metallic tin); Empresa Minera Barrosquira/Bajadería Ltda., La Paz (tin); Empresa Minera Himalaya S.A., Potosí (tungsten); Empresa Minera Inti Raymi S.A., Oruro (gold and silver); Empresa Minera La Solución S.A., La Paz (lead, silver, and zinc); Empresa Minera Unificada S.A. (EMUSA), Potosí, (antimony); Grupo Minero La Roca S.A., La Paz (gold); and Minera San Cristobal S.A., Potosí (lead, silver, and zinc) (Asociación Nacional de Mineros Medianos, 2003, p. 49, 57).

Although Bolivian antimony production appeared to increase in 2001 and 2002, EMUSA actually closed most of its mine operations in 1999 and has registered production mostly from stockpiles since that time. For the other medium-scale mining companies, many were able to increase their production through intensive capital investment in technology despite only a minimal (if any) improvement in most mineral commodity prices in 2002 (U.S. Commercial Service, 2004).

In 2002, fewer than 38,000 people were employed in the nonhydrocarbon mining sector and the medium-scale mining companies employed less than 10% of that labor force, which included administrators, executives, technical professionals, and other workers (Instituto Nacional de Estadística, 2004b§). COMIBOL employed fewer than 200 workers and administrators to fulfill its primary roles as a holding company and market intermediary. For example, one of the major duties for COMIBOL was to coordinate and purchase output from small-scale mines and mining cooperatives for resale or export. The small-scale mining sector employed about 90% of the labor force in the nonhydrocarbon mining sector (U.S. Commercial Service, 2004).

Environmental Issues

Since 2001, environmental standards in Bolivia have been monitored by the Ministerio de Desarrollo Sostenible y Planificación (MDSP) at the national level and its Secretaría Departamental de Desarrollo Sostenible y Medio Ambiente at regional and departmental levels (Metals & Minerals Latin America, 2001). The other Bolivian Government agency with oversight responsibility for environmental matters was the Viceministra de Medio Ambiente, Recursos Naturales y Desarrollo Forestal. Increasing environmental concerns have led the Bolivian Government to join various international environmental agreements, including Conventions on Biodiversity, Climate Change, Endangered Species, Tropical Timber 83, Tropical Timber 94, Law of the Sea, Nuclear Test Ban, and Wetlands. Many agreements associated with these conventions were signed by the Bolivian Government but not ratified by the end of 2002 (U.S. Department of Energy, 2003§).

During 2002, the MDSP was subject to strong protests by environmental groups against any Government money going toward building a second gas pipeline across the tropical forest areas of Bolivia and Brazil at the headwaters of the Pantanal watershed, which are the world's largest wetlands. The focus of international environmental groups, such as Amazon Watch, Friends of the Earth, and The World Wildlife Fund, has been on getting Bolivian Government agencies to control excessive erosion, water and air pollution, illegal hunting, and unauthorized access to the route of this new extension to the main Bolivia-Brazil pipeline, where it runs through the Chiquitano Forest (U.S. Department of Energy, 2003§).

In 2002, these environmental groups were also calling for the Inter-American Development Bank to stop funding any pipelines in Bolivia. These protests were apparently in response to the Bolivian Government's agreement to double the capacity of a pipeline to northern Argentina by the end of 2002, with construction scheduled to expand the capacity of this pipeline by more than four times by 2005-06. Another Bolivia-Brazil pipeline was also being considered for approval by the Bolivian Government in 2002. The pipeline would connect the southern parts of Bolivia and Brazil and possibly run through Paraguay or Argentina (U.S. Department of Energy, 2003§).

In the nonhydrocarbon mining sector, national environmental regulations that require environmental impact studies for all new mining projects became effective in 1996 and required existing mining operations to upgrade environmental quality control systems. Failure to comply with these regulations by the end of 2002 was to be punishable by forced mine closure. Even if enforced, however,

this legislation did not address the treatment of the remnants of historical pollution generated during the past 500 years of mining near or in many urban areas. In 2002, the worst mining pollution, which was primarily the result of accumulated mine and mill tailings, was in the cities of Oruro and Potosí; at the heads of the Cotagaita, the Pilcomayo, and the Tupiza Rivers; and in the southern part of the Desaguadero River (U.S. Commercial Service, 2004).

Production

In 2002, the value of metals and minerals production in Bolivia increased to \$370.8 million, which was an increase of 0.24% compared with that of 2001 (U.S. Commercial Service, 2004). This slight increase in production somewhat reversed a contraction of 4.8% in 2001 (Fondo Latinoamericano de Reservas, 2003§). The medium-scale mining sector continued to be the major producer of gold, lead, silver, and zinc. Overall, medium-scale mines produced 68% of the total value of Bolivian mine production in 2002. The small-scale mining sector comprised the remaining 32% of mine production and was Bolivia's major producer of antimony, tin, tungsten, and ulexite (a boron mineral) in 2002 (Asociación Nacional de Mineros Medianos, 2003, p. 21, 68).

In 2002, Bolivian mine production of ulexite increased by 24.6% compared with that of 2001. Lead increased by 11.7%; silver, 9.5%; tin, 3.3%; and antimony, 3.2%. Tungsten decreased by 25%; gold, 3.9%; and zinc, 2.6%. Registered mine production of antimony increased in 2002, although EMUSA was still primarily engaged in recovery of old stocks, some with high lead content. Other than lead, silver was the only mineral for which mine production levels significantly increased; gold mine production was expected to continue to wane because the Kori Kollo open pit mine had run out of reserves (U.S. Commercial Service, 2004).

In 2002, Kori Kollo was able to stay in production by heap-leaching oxide gold lode from its nearby Llagua gold project and reprocessing old Kori Kollo mine tailings (U.S. Commercial Service, 2004). Kori Kollo, which is located in the arid Altiplano north of the city of Oruro, was responsible for about 70% of Bolivia's gold production in 2002; it is located on concessions issued to Empresa Minera Inti Raymi S.A., in which Newmont Mining Corp. of the United States held an 88% equity interest and a private Bolivian investor owned the remaining 12% (Fox, 2003).

Although zinc output decreased slightly in 2002, production of zinc still dominated the base-metal mining industry in Bolivia. In terms of the value of mine output, gold slightly surpassed zinc in 2002, but this ranking was an anomaly that was not expected to repeat in 2003. In 2002, the value of the mine output of silver was less than two-thirds the value of zinc, and that of tin was only slightly less than that of silver. The next highest mineral commodity, in terms of value, was ulexite, but its value was less than one-tenth the value of Bolivia's tin output (U.S. Commercial Service, 2004).

COMSUR was responsible for about 75% of Bolivia's lead output, 50% of its zinc output, and 40% of its silver output. Rio Tinto Plc. had a 30% interest in COMSUR in 2002. COMSUR (a subsidiary of Minera del Sur S.A.) had additional interests in Argentina. In Bolivia, COMSUR's portfolio of properties grew more diverse in 2002 and included the former COMIBOL mine at Porco, which was the company's and the country's leading zinc mine; the recently acquired Colquiri tin-zinc mine, which began producing again; and the Don Mario gold-silver-copper prospect in the Precambrian Shield. Plans for another new COMSUR acquisition, the Vinto antimony smelter, may include conversion to treat zinc or even tin. Overall, the medium-scale mining sector was responsible for 85% of total zinc production in Bolivia (Fox, 2002).

Trade

During the past 5 years, the external economy has been a strong driving force in the trend toward increased hydrocarbon production and decreased metallic and nonmetallic minerals production as a percentage of Bolivia's GDP (Fox, 2003). In 1997, the entire mineral industry contributed almost one-half of the total value of Bolivia's exports, with exports of metallic and nonmetallic minerals accounting for \$480.9 million and exports of hydrocarbons, just \$97.8 million. In 2002, the mineral industry contributed about the same proportion of the total value of exports. Exports of metallic and nonmetallic minerals, however, were valued at only about \$346.9 million, which was still an increase of 2% compared with that of 2001. Hydrocarbon exports totaled almost \$346.4 million, which was an increase of more than 14 % compared with that of 2001 (Instituto Nacional de Estadística, 2004d§).

Total export revenues increased by about 1.6% to more than \$1.37 billion in 2002. In particular, natural gas exports were valued at \$266.2 million, which was an increase of 11.2% compared with that of 2001 and ranked natural gas as the second most valuable export commodity for Bolivia (soy products were first) (Instituto Nacional de Estadística, 2004d§). This export performance of natural gas was remarkable given the global slowdown in demand and higher relative costs of Bolivian production compared with that of two major natural gas export markets, Argentina and Brazil, which experienced significant currency devaluations during 2002. The average exchange rate was devalued by 211% in Argentina and by about 23% in Brazil compared with an average devaluation of only about 8.5% in Bolivia. The continued importance of these and other export markets can be explained by a basically stagnant level of Bolivian domestic demand in 2002, which grew by only about 1.6% for all goods despite a significant growth in investment and public expenditure (Fondo Latinoamericano de Reservas, 2003§).

The 2002 value of Bolivian exports of zinc was slightly more than \$112 million, which was about 5.8% less than that of 2001 and less than one-half the value of natural gas exports in 2002 (\$266 million). Zinc continued to dominate Bolivian exports of metallic and nonmetallic minerals, with exports of gold ranking second at about \$89.7 million, which was a decrease of about 2.8% from that of 2001. The value of some traditional mineral exports, which included that of antimony (79.9%), silver (27%), lead (12.5%), and tin (3.8%), increased significantly in 2002. During 2002, 73.9% of Bolivia's metal and mineral exports went to Europe followed by the Americas (21.5%) and Africa, Asia, and others (4.6%). Switzerland, which was the leading importer of metallic and nonmetallic

minerals from Bolivia in 2002, received almost 61.7% of Bolivia's mineral exports. The United States, which was a distant second, received only about 10.5 % of Bolivia's mineral exports, most of which were metals (Instituto Nacional de Estadística, 2004d§, 2005§).

Almost all the remaining Bolivian export revenue came from exports of nontraditional goods that were valued at about \$626.6 million in 2002. The major commodities exported were, in order of importance according to percent of the total value of exports, ignoring reexportation, soybeans (24%), natural gas (20%), zinc (8.5%), gold (6.8%), silver (5.2%), and tin (4.4%). With respect to all goods and considering only single countries, 25% of Bolivia's total exports went to Brazil in 2002, followed by Switzerland (16%), the United States (13%), Venezuela (13%), and Colombia (11%) (Instituto Nacional de Estadística, 2004d§).

As a result of the Andean Trade Promotion and Drug Eradication Act (ATPDEA), which was signed into law in August 2002, Bolivia's export sector opened up important growth opportunities. With this law, the United States continued to be an important market for Bolivian leather, jewelry manufactures, textiles, and wood. In 2002, Bolivia's trade deficit with the United States was slightly less than \$105.5 million, which was a 48% decrease compared with that of 2001. U.S. goods exported to Bolivia in 2002 totaled more than \$276 million, which was down 11.8% from the previous year. U.S. imports from Bolivia totaled about \$171 million, which was up 8.4% from 2001 (U.S. Embassy, La Paz, Bolivia, 2003§).

In 2002, foreign direct investment (FDI) in the nonhydrocarbon mining sector of the Bolivian economy totaled about \$11.6 million, which was less than 1.2% of total FDI (\$999 million) in the country during the year. The U.S. contributed about \$2.4 million towards mining exploration and exploitation in this sector, which was down from \$23 million in 2001. In 2002, this left the United Kingdom as the most significant contributor to FDI in the Bolivian nonhydrocarbon mining sector, with more than \$5.4 million invested. Overall, FDI in this sector fell by 66.5% in 2002, mostly owing to the large decrease in U.S. participation (Instituto Nacional de Estadística, 2004a§).

U.S. FDI in Bolivia was concentrated primarily in the construction and hydrocarbons sectors (U.S. Embassy, La Paz, Bolivia, 2003§). In 2002, total FDI for exploration and exploitation of Bolivian crude oil and natural gas totaled about \$462.8 million, which was more than 46.3% of all FDI in the Bolivian economy. In 2002, U.S. companies were the primary foreign investors in the hydrocarbons sector with a total investment of about \$161 million, followed by Spanish companies, which invested about \$161 million, and Brazilian companies, about \$161 million. Overall, FDI in the Bolivian economy followed a similar pattern across interested countries—companies based in the United States invested \$289 million closely followed by those based in Spain (\$268 million), and then by those based in Brazil (\$182 million) (Instituto Nacional de Estadística, 2004a§).

Owing to the large flows of foreign capital associated with the construction of new gas pipelines, overall imports of goods and services recovered by 7.7% in 2002 from an overall contraction in 2001 (Fondo Latinoamericano de Reservas, 2003§). Total imports were valued at \$1.8 billion, and mostly included capital goods, chemicals, food, petroleum, and raw materials and semimanufactures. For example, Bolivia's major imports from the United States were computers, machinery, vehicles, and wheat (U.S. Embassy, La Paz, Bolivia, 2003§).

Commodity Review

Metals

Antimony.—Bolivia has traditionally been one of the world's leading antimony producers. Increases in world prices for antimony resulted in an increase in Bolivian antimony mine output to 2,336 metric tons (t) in 2002 from 2,264 t in 2001 (Instituto Nacional de Estadística, 2005§). Small-scale mines produced 96% of the total output mostly in the form of antimony concentrates (Asociación Nacional de Mineros Medianos, 2003, p. 69).

Prices increased enough to generate rumors that Bolivian producers might restart major antimony smelting operations (Mining Journal, 2002b). The Vinto antimony smelting plant was the largest antimony smelter in the country when it was purchased by CMC at the end of 2000. At the time, CMC intended to convert the plant into another tin smelter to gain control of an integrated process to produce metallic tin with feed from COMSUR's Colquiri tin mine. COMSUR's majority ownership of the Vinto smelter (through CMC), however, was the subject of protests and strikes by the small-scale miners (Mining Journal, 2001). The Vinto smelter did not produce antimony metal in 2002. Most antimony mine output was exported to be smelted as far away as China (Mining Journal, 2003). In 2002, the approximately 195 t of metallic antimony produced in Bolivia appears to have been the output of only small private smelters (Bocangel, 2001§). Production of antimony trioxide, which was traditionally volatilized at small beneficiating plants such as Cía. Minera Salinas S.A., has not been reported separately since 2001 (U.S. Commercial Service, 2004).

Traditionally, EMUSA was responsible for most antimony production in the country. Production came from three mines—Caracota, Chilcobija, and Espiritu Santo. The Chilcobija mine, which was the country's oldest and largest antimony mine, had produced between 4,000 and 5,000 metric tons per year (t/yr) of antimony concentrate. EMUSA placed production at the mine on hold in 1999, however, pending improved antimony prices. Prices apparently did not improve enough in 2002, and EMUSA produced only 90 t of antimony during the year (Asociación Nacional de Mineros Medianos, 2003, p.20).

Gold.—In 2002, the decrease in Bolivian gold production was primarily the result of the closure of COMSUR's El Puquio Norte Mine and a decrease in gold production at Inti Raymi following suspension of operations at the Kori Kollo open pit mine (Fox, 2003). About 80% of Bolivian gold production came from the medium-scale mining sector, and the remaining 20%, from small-scale mining cooperatives (Asociación Nacional de Mineros Medianos, 2003, p. 67).

In 2002, the Kori Kollo Mine produced 249,400 troy ounces (7,745 kg) of gold, which was 9.24% less than in 2001. In 2003, the Kori Kollo Mine was expected to produce roughly one-half as much gold as in 2002 and the mill was expected to be closed later in the year. By the end of 2002, the mine had only 8 million metric tons (Mt) of proven reserves remaining with an average grade of 0.023 troy ounce per short ton [0.789 gram per metric ton (g/t)] gold, and 22.6 Mt of proven and probable reserves with about the same average grade of gold. This was actually higher than its 19.1 Mt of proven and probable reserves in 2001, although those reserves contained a grade of 0.032 troy ounce per short ton (1.1 g/t) gold. In 2002, the amount of probable and proven reserves at Kori Kollo also included new probable reserves that totaled about 12.5 Mt at an average grade of 0.023 troy ounces per short ton (0.789 g/t) gold from the undeveloped Kori Chaca deposit 40 kilometers (km) southeast of the Kori Kollo Mine (Newmont Mining Corporation, 2003, p. 38-9, 41, 54). A potential heap-leach project that would use ore transferred to the Kori Kollo mill from the Kori Chaca Mine may keep the Kori Kollo mining facilities open until about 2005 (Fox, 2003).

Toronto, Ontario, Canada-based Orvana Minerals Corp. announced that construction of the Don Mario gold project in the Chiquitania region of eastern Bolivia was proceeding on budget and according to schedule in 2002. Foundations were basically completed. The freshwater reservoir was completed in 2002 and construction of the tailings dam was underway. Orvana also continued to develop the lower mineralized zone. After the shaft is sunk, lateral development of drifts, raises, cross cuts, and ventilation shafts will continue in the lower levels of the mine (Orvana Minerals Corp., 2002). Orvana controlled its interests in the Don Mario Mine and property through its wholly owned subsidiary Empresa Minera Paititi S.A. About \$15 million had been spent on capital and development costs by the end of 2002 (Fox, 2003).

Under a 2001 agreement between Orvana and COMSUR, COMSUR invested \$4 million in Orvana on January 11, 2002, to purchase a majority interest in Orvana and to obtain certain other share-acquisition rights. In addition, COMSUR agreed to finance the purchase by Paititi from COMSUR of a mining concession that had a gold mill plant and equipment with an estimated value of \$8 million. Given the successful completion of this financial arrangement and with total project capital and development costs expected to exceed \$18 million in 2003, Orvana expected the Don Mario Mine to be commissioned in late March 2003, as scheduled, and to begin treating 600 metric tons per day (t/d) of ore (Orvana Minerals Corp., 2002).

Golden Eagle International Inc. was a gold exploration and mining company that was located in Salt Lake City, Utah, and had offices in La Paz and Santa Cruz, Bolivia. During 2002, the company focused its efforts on developing its mining rights on 20,194 hectares (ha) of its Cangalli properties in the Tipuani Gold Mining District, which is located 100 km north of La Paz in western Bolivia. The company also focused on continuing exploration and development of its Precambrian properties on 55,241 ha in eastern Bolivia's Precambrian Shield, which is located 280 km north of Santa Cruz, Bolivia. Golden Eagle purchased the Cangalli properties on July 2, 2002, under a 25-year exploration and mining contract with United Cangalli Gold Mining Cooperative, Ltd. and began operations on September 30, 2002. During the fourth quarter of 2002, this operation initially processed an average of 1,000 t/d of ore and doubled Cangalli's capacity to 2,000 t/d by the end of the quarter. In total, for the quarter, Cangalli processed 92,400 t of ore to recover about 4.4 kg of gold. Golden Eagle owned four additional mining claims that totaled 1,927 ha in Tipuani and acquired additional Precambrian properties, which consisted of four mining claims that totaled 6,323 ha in Bolivia's Precambrian Shield (Simpson, 2004§).

Tantalum.—In 2002, General Minerals Corporation, which was a Denver, Colorado-based firm, made progress with its hard-rock tantalite and colluvial placer tantalite project, which was located 160 km northeast of Santa Cruz in eastern Bolivia. The washing plant on the Agua Dulce claim block completed four bulk tests on colluvial placer tantalite material associated with Caracore pegmatite. Each test recovered salable tantalite concentrate. The mineralization occurs as surface gravel that can be mined simply by digging it up with a backhoe, washing it with water, and concentrating it in a jig. Mining with explosives or crushing the rock is not necessary to extract the mineral (General Minerals Corporation, 2003).

During 2002, General Minerals continued exploration on the Rio Blanco portion of its tantalum properties where it located anomalous gold and tantalum. After 2002, owing to the persistent weak price of tantalum, the company decided to pull out of the tantalum business in Bolivia temporarily. Owing to its successful exploration activities, General Minerals had positioned itself to produce tantalite and to generate a modest cash flow after 2002. This project became temporarily infeasible when the price of tantalum oxide fell to less than \$18 per pound from \$140 per pound because of a severe slowdown in the telecommunications industry, which had been a major user of tantalum (General Minerals Corporation, 2003).

Iron and Steel.—The planned privatization of Bolivia's El Mutún iron ore deposit and potential long products steelworks made some progress in 2002. The companies that had already acquired the rights to bid on El Mutún were the Brazilian steelmaker Siderúrgica Sul Catarinense S.A. (SIDERSUL) and COMSUR. Other companies had expressed interest, but had not bought the terms of reference by the end of 2002; they were BHP Billiton Plc, the Argentinian steelmaker ACINDAR S.A., and the Brazilian steelmaker Gerdau Group. Bids were to be evaluated by representatives of the Ministerio de Comercio Exterior y Inversión, the Ministerio de Desarrollo Económico, and COMIBOL. In 2002, COMIBOL was entitled to earn royalties on any production from El Mutún, as with many mining properties in Bolivia. Because this property is located within a 50-km "strategic zone" at Bolivia's border with Brazil, this property could not be completely privatized and any interested company would have remained only a joint-venture partner with COMIBOL. Although the bidding process had not yet concluded by the end of 2002, the Bolivian Government was considering imposing a condition to have a 150,000-t/yr steel plant included in the first phase of the project, which would be in addition to the originally planned iron ore mining and concentration project. Output from this steel plant would be sufficient to cover Bolivia's domestic steel demand (Metal Bulletin, 2002).

Lead, Silver, and Zinc.—In 2002, zinc output dominated the Bolivian base-metal mining industry, and zinc concentrates represented Bolivia's largest nonhydrocarbon mineral export. Bolivia's production of lead concentrates was 9,893 t; zinc, 141,558 t; and silver 450 t. The output of metallic silver decreased to about 31,900 kg. Medium-scale companies produced about 85% of the zinc, 59% of the silver, and 58% of the lead; small-scale mines were responsible for the remainder of the Bolivian production of each of these minerals (Asociación Nacional de Mineros Medianos, 2003, p. 71-3).

A grant by the U.S. Trade and Development Agency (TDA) was awarded toward the cost of a feasibility study of the San Bartolomé silver project, which was located on the flanks of Cerro Rico near Potosí; the study was due for completion in early 2004. San Bartolomé is a historic mining center that is located in southern Bolivia. The owner was Cía. Minera Manquiri (a subsidiary of Coeur d'Alene Mines Corporation of the United States). A prefeasibility study in 2000 concluded that a 7,000- to 7,500-t/d mining operation could be constructed at an estimated capital cost of from \$70 million to \$90 million. According to the prefeasibility study, the operation would be capable of producing approximately 6 million ounces per year of silver at an estimated cash cost of \$3.50 per ounce during a mine life of from 8 to 10 years. According to independent ore reserves reports for this project, a significant portion of the mineralized material was reclassified as containing proven and probable ore reserves of 40.3 Mt of ore at an average grade of 108 g/t silver (Coeur d'Alene Mines Corporation, 2003).

San Cristobal was among the largest silver-zinc deposits of its kind in the world. San Cristobal is located in the Department of Potosí. It hosts approximately 14 t of silver and more than 3.6 Mt of zinc that is contained in 220 Mt of proven and probable reserves. Apex Silver's Bolivian exploration activities focused on a wide and potentially well-mineralized string of silver deposits that extends from San Cristobal in the southwest to Potosí in the northeast. The objective was to identify potentially large regional systems that could lead to major discoveries of commercially viable deposits such as San Cristobal. Apex Silver reported a net loss of \$8.3 million in 2002 compared with that of \$8.1 million in 2001 (Apex Silver Mines Limited, 2003, p. 7-10).

After temporarily pulling out of the tantalum business in Bolivia, General Minerals focused on the Atocha silver project. At Atocha, the company completed a program of regional channel sampling of Atocha sandstone, which is host to the mineralization. Results were positive and indicated the presence of anomalous silver at a number of locations within approximately 10 km of strike length. The Atocha silver prospect is located approximately 100 km south-southwest of the city of Cochabamba in the Arque Province in west-central Bolivia. In 2002, the Atocha property, which was controlled by General Minerals, consisted of 7,250 ha, of which 6,400 ha was staked and 100% owned by the company and 850 ha was under option. Silver was mined historically from two principal areas, Carmen/Santa Isabel and Condor, within a zone of intensive silicification that measures approximately 2 km by 300 m. Two types of silver mineralization occur in these veins that host silver, associated copper mineralization, and sediment-hosted disseminated mineralization within the sandstone (General Minerals Corporation, 2003).

Tin.—In 2002, Bolivian tin production was 15,242 t, and the value of the tin output attributed to the country's total mineral exports increased to \$61,853 million in 2002, which was a 12.2% decline from the export value of 2001 (U.S. Commercial Service, 2004). The medium-scale mining sector produced 43% of the total, and small-scale mines produced the remaining 57%. Since 2000, COMIBOL has not been officially recorded as having produced any tin, although it officially produced almost 40% of Bolivia's tin in 1999 (Asociación Nacional de Mineros Medianos, 2003, p. 70).

At the end of July 2002, miners from the Huanuni tin mine and other mining cooperatives in the same sector requested that the Bolivian Congress modify article 91 of the Mining Code, through which the promulgation of law 2400 would allow COMIBOL to take over the administration and direction of Empresa Minera Huanuni S.A. owing to the insolvency and bankruptcy of its owners, RBG Resources. Their motion was filed and COMIBOL resumed operational control of the Huanuni tin mine during the last 2 months of the year. Huanuni was initially seized by the Bolivian authorities in April 2002 after RBG Resources was found to be the subject of acriminal investigation in the United Kingdom (Mining Journal, 2002a).

In 2002, the sale of the Vinto tin smelter to CMC, which was majority owned by COMSUR, was due to be investigated further by COMIBOL in 2003. The "Vinto smelter" was actually a complex of three smelters, one for low grade tin, one for higher grade tin, and one for antimony. Only the two tin smelters were sold to CMC in June 2002, and they are the only parts of the Vinto complex that may again come under control by COMIBOL as a result of this investigation. The ownership of the antimony smelter was not being investigated because it was purchased by CMC from state-owned EMV in 2001. The remaining tin smelters, however, may revert back to ownership by EMV, which is the firm that originally sold the Vinto tin smelters to Allied Deals in 2000 (Actis Capital LLP, 2002§).

Industrial Minerals

Cement.—Bolivia produced 1,010,446 t of cement in 2002. Production increased by 2.8% compared with that of 2001. The major producer, Sociedad Boliviana de Cemento S.A. (SOBOCE), directly owned the Viacha and the Warnes plants in La Paz, and the Tarija plant of Cemento El Puente S.A., which SOBOCE had acquired in 1999. In 2002, production at these three plants totaled 398,000 t/yr of cement capacity and 338,000 t/yr of clinker capacity. SOBOCE controlled 70% of the Bolivian cement industry in 2002 partially owing to its controlling a 33.34% stake in Bolivia's second leading producer Fabrica Nacional de Cemento (FANCESA), which operated an estimated 334,000 t/yr unit at Cal Oro. This estimate of cement production at Cal Oro in 2002 was based on an installed clinker line that was rated at 276,000 t/yr prior to 2002. The Cal Oro facility was upgraded in 2002 after FANCESA installed an improved mill. This improvement may have increased the clinker capacity to about 300,000 t/yr at Cal Oro,

but updated data on actual production was not available by the end of 2002. In 2002, SOBOCE also acquired Empresa Minera Industrial S.A. (EMISA), which was formerly owned by Fletcher Building Ltd. of New Zealand and Itacamba Cemento S.A. of Bolivia. EMISA's clinker capacity at Oruro was thought to be about 130,000 t/yr, and its cement capacity, approximately 190,000 t/yr. Besides SOBOCE, the other major Bolivian producer was Cooperativa Boliviana de Cemento (COBOCE), which operated a 320,000-t/yr cement and a 300,000-t/yr clinker facility at Cochabamba. A "grinding only" facility (Cementos Camba) at Itacamba had a clinker capacity rated at approximately 130,000 t/yr and a cement capacity that was thought to be a bit higher than that (International Cement Review, 2003).

Mineral Fuels

According to the Bolivian state oil and gas company Yacimientos Petrolíferos Fiscales Bolivianos (2003§), Bolivia produced about 11.3 million barrels (Mbbl) of crude oil and 6.42 billion cubic meters of natural gas in 2002. Proven and probable certified petroleum and natural gas reserves at the beginning of 2003 totaled about 957 million barrels and about 1.55 trillion cubic meters, respectively. Bolivia was largely self-sufficient in crude oil and almost all crude oil produced in Bolivia was for domestic consumption. Bolivia has the potential to be a major world natural gas exporter with presumably the second largest gas reserves (after Venezuela) in South America. By the end of 2002, Empresa Petrolera Andina S.A. (Andina) owned 25.7% of these reserves (U.S. Energy Information Administration, 2002§).

The Bolivia-Brazil pipeline, which tapped Bolivia's Rio Grande sources, came onstream in July 1999. It was the largest private sector infrastructure project in South America, and partners included Enron Corp., which was planning to sell its share; BG Group Plc. (British Gas); El Paso Corporation; Petroleo Brasileiro S.A. (Petrobras); Shell Oil Co.; and Totalfina Elf S.A. The project began in 1996 and cost \$2.1 billion. It served São Paulo, Brazil, with an extension southward to Porto Alegre. Petrobras's preferential access to the Brazilian section of the Bolivia-Brazil pipeline and the pricing of Bolivian gas have become controversial. Among other problems, the depreciation of Brazil's currency and high transportation tariffs have raised the price of Bolivian gas, thus making it less competitive with fuel oil and liquefied petroleum gas (U.S. Energy Information Administration, 2002§).

Despite environmental protests and the financial difficulties of Enron Corp., the second Bolivia-Brazil pipeline, which was developed and operated by Gas Transboliviano S.A. (GTB), came onstream in April 2002. The 348-mile pipeline started in Rio San Miguel, Bolivia, where it connected to the main Bolivia-Brazil pipeline. The pipeline then passed through San Matias and extended to Cuiabá, Brazil, where the pipeline fueled a 480-megawatt thermal powerplant (U.S. Department of Energy, 2003§). In 2002, GTB was still a joint venture among Enron, the Royal Dutch/Shell Group (Royal Dutch Petroleum Company, the Netherlands, 60%, and The "Shell" Transport and Trading Company Plc, UK, 40%), and Transredes S.A. [controlled by Enron Transportadora S.A. (an Enron subsidiary), 50%], and Shell Gas B.V. [a member of the Royal Dutch/Shell Group, 50%]. GTB also operated the Bolivian portion of the main Bolivia-Brazil pipeline in 2002 (BG Group Plc., 2004§).

A new project under study was a liquid natural gas export project to sell gas to the United States and Mexico. The Bolivian Government expected to receive two reports on the selection of ports in Chile or Peru as the export terminals and was also eager to develop gas-to-liquid projects that would provide substitutes for diesel and be used in petrochemicals projects, to make fertilizers, and as fuel for thermoelectric plants. Pacific LNG (the consortium that was developing this project) was made up of British Gas (37.5%), Repsol YPF, S.A. (37.5%), and Pan American Energy LLC (British Petroleum Plc and BRIDAS Corp.) (25%). The most expedient strategy would be to export through Chile. About 80% of the population, however, opposed a deal with Chile because they were still bitter about a war fought during the late 1800s that resulted in Bolivia losing its direct access to the Pacific Ocean. They wanted the Government to use the port of Ilo in Peru. Pacific LNG was nonetheless leaning toward the Chilean port of Patillos owing to the greater economic feasibility of using that location as an export outlet (Alexander's Gas & Oil Connection, 2003).

Infrastructure

The transportation network of Bolivia comprised 52,216 km of highways. The Pan-American Highway, which linked Argentina and Peru, crossed the country from south to northwest. The rail system consisted of two independent lines that were separated by the eastern Andes. The western line connects the cities of Cochabamba, La Paz, which is the capital, and Oruro with northern Argentina and the Chilean Ports of Antofagasta and Arica. The eastern line connects Santa Cruz with northern Argentina and western Brazil (U.S. Central Intelligence Agency, 2002§).

Outlook

FLAR expected the Bolivian economy to recover "modestly" after 2002, owing to what appeared to be an imminently more profitable situation in the hydrocarbon sector and a greater potential for increased export activity (Fondo Latinoamericano de Reservas, 2003§). The country is expected to benefit from the startup of operations of the recently constructed gas pipeline to Brazil and to continue to pursue operating a second pipeline, provided that the Brazilian Government is able to appease environmental and other activists. Such expectations are conditional not only on common economic uncertainty in exchange rates and prices, but on the difficult attainment of political stability in the face of "difficult problems with deep-seated poverty, social unrest, and drug production" (U.S. Central Intelligence Agency, 2002§, p. 1). Natural gas exports, however, are expected to be stimulated at least temporarily by the currently (2002) higher real exchange rate of the currencies of the two most important trading partners, Argentina

and Brazil. Also, the Andean Tariff Preferences Act is expected to provide tariff benefits for Bolivian trade in all sectors (U.S. Embassy, La Paz, Bolivia, 2003§).

In 2002, poverty continued to impede Bolivian economic growth with almost no evidence of a recovery in private sector expenditure. Meanwhile, impending international payments due from the Bolivian Government are expected to depress the temporarily higher public sector consumption and investment. In 2002, the Bolivian Government planned to minimize this deterioration in its own domestic spending by obtaining a large part of its necessary international financing requirements under concessional conditions. The Government and the International Monetary Fund are expected to sign a standby agreement on April 2, 2003, that will provide approximately \$118 million to support the Government's economic program until April 2004. Presumably, multilateral organizations will be expected to provide an important net flow of funds (approximately \$418 million) after the agreement is signed (Fondo Latinoamericano de Reservas, 2003§).

Especially for the mining sector, FDI will be crucial for future development because domestic private investment is not growing in Bolivia, and the Bolivian Government's future expenditures appear to be mostly committed elsewhere. Any mining outlook for Bolivia after 2002, therefore, should take into account the uncertainties concerning COMIBOL's plans to manage the assets that come under its control and to intervene in disputes over the ownership of Bolivian mining properties, whether those involved in the dispute are domestically privatized companies, foreign investors, or joint ventures. COMIBOL's interests in 2002 became even more diverse, owing to resumption of control of the Huanuni tin mine. If COMIBOL manages to retain control of Huanuni in the face of ongoing protests by small-scale miners, then it will have to either make the insolvent operation solvent again or reprivatize it. Although international lenders appear to continue to encourage privatization, the amount of investment that COMIBOL has required of international and domestic investors to refurbish mining properties, such as Huanuni and the Vinto Smelter, the amount of royalties that COMIBOL is owed on such properties, the rights to exploitation of many parts of these properties by small-scale miners and cooperatives, and uncertainty in the political governance structure could easily deter FDI in Bolivia's mining sector for some time. In particular, the number of mining companies undertaking major mining exploration and development activities in Bolivia had decreased to 9 companies by the end of 2002 from more than 50 in 1996. COMSUR was the only domestic company left among these nine firms (U.S. Commercial Service, 2004).

Nonetheless, reports that only 15% of Bolivia's mining potential, which includes the virtually untouched Precambrian Shield geological area of Bolivia that is considered to hold "vast" mining potential, has been exploited should continue to attract investors to the country's mining sector (U.S. Commercial Service, 2004, p. 11). In 2002, although COMIBOL still controls properties with vast mineral assets, such as El Mutún and Huanuni, foreign investors are participating in many of the most promising projects, such as Kori Chaka (gold), San Bartolomé (silver), and San Cristobal (lead, silver, and zinc). The San Cristobal concession is Bolivia's largest pending mining project and is expected finally to create sufficient return to justify a joint-venture private investment in COMIBOL's Karachipampa smelter where the lead and silver from San Cristobal is expected to be processed. Production at San Bartolomé is expected to begin in late 2005. If prices of gold, silver, lead, and zinc increase substantially, then the ongoing uncertainty in Bolivia is not likely to be sufficient to stop most of these projects from going forward (U.S. Commercial Service, 2004).

Gold appears to have attracted plenty of foreign investment to Bolivia even with depressed prices for 2002. The Kori Kollo Mine, which was responsible for 75% of Bolivian gold production in 2002, however, is due to be mined out and shut down during the first half of 2003. Leach gold production will continue at Kori Kollo until the oxide ore stockpiles are depleted (Newmont Mining Corporation, 2003, p. 20). Golden Eagle, Orvana, and other gold mining companies appear poised to pick up any slack in Bolivian gold production beyond 2002, especially if a favorable swing in the gold price takes place. Orvana expects the Don Mario Mine to be commissioned in late March 2003 (Orvana Minerals Corp., 2002). Golden Eagle projects that a 3,500-t/d capacity plant and mine expansion at Cangalli will be completed by July 1, 2003 (Simpson, 2004§).

In 2002, COMSUR continued to expand and diversify its interests in Bolivia. COMSUR already dominates Bolivian production of lead, silver, and zinc but appears able to compete favorably for new properties that have proven reserves of antimony, gold, and tin, including the Don Mario gold project. As the only domestic company that is undertaking major exploration and development projects in Bolivia, COMSUR is expected to continue to be able to identify such new properties and to attract FDI.

As with many of the country's commercial sectors, the mining sector suffers from unemployment or underemployment. Many already trained small-scale miners could be employed either by COMIBOL or private investors if mining property ownership issues are resolved. Additionally, the hydrocarbon sector may be able to provide at least a temporary boost to development efforts in Bolivia, in part by retraining and employing former small-scale miners. This sector, however, appears to be the focus of much of the social unrest in the country in 2002 and the employment potential is not as great as in the nonhydrocarbon mining sector. Any expected economic recovery in Bolivia will be contingent on how these issues are resolved.

References Cited

- Alexander's Gas & Oil Connections, 2003, Bolivia's gas reserves expected to rise: Alexander's Gas & Oil Connections, v. 8, no. 5, March 6, 1 p.
- Apex Silver Mines Limited, 2003, Global positioning in silver, annual report 2002: Cayman Islands, British West Indies, Apex Silver Mines Limited, March 27, 40 p.
- Asociación Nacional de Mineros Medianos, 2003, Memoria e informe anual 2002: La Paz, Bolivia, Asociación Nacional de Mineros Medianos, 83 p.
- Coeur d'Alene Mines Corporation, 2003, The next generation in silver, 2002 annual report: Coeur d'Alene, Idaho, Coeur d'Alene Mines Corporation, March 20, 122 p.
- Fox, David, 2002, Bolivia: Mining Journal Annual Review 2002, CD-ROM.
- Fox, David, 2003, Bolivia: Mining Journal Annual Review 2003, CD-ROM.
- General Minerals Corporation, 2003, 2002 annual report: Denver, Colorado, General Minerals Corporation, May 16, 20 p.
- International Cement Review, 2003, Bolivia, in The global cement report: Dorking, United Kingdom, Tradeship Publications Ltd., December, p. 77-78.
- Metal Bulletin, 2002, Miners and steelmakers show interest in Mutún: Metal Bulletin, no. 8683, June 17, p. 13.

Metals & Minerals Latin America, 2001, Bolivia to fast track new environmental rules: Metals & Minerals Latin America, v. 6, no. 47, November 19, p. 3.
Mining Journal, 2001, Development—Rehabilitated Colquiri in commissioning: Mining Journal, v. 336, no. 8640, June 29, p. 494.
Mining Journal, 2002a, Production—COMIBOL to return to Huanuni: Mining Journal, v. 338, no. 8689, June 14, p. 445.
Mining Journal, 2002b, Antimony soars: Mining Journal, v. 339, no. 8704, September 27, p. 221.
Mining Journal, 2003, Minor metals in April—Antimony: Mining Journal, v. 340, no. 8733, April 25, p. 288.
Newmont Mining Corporation, 2003, Newmont the gold company, annual report 2002: Denver, Colorado, Newmont Mining Corporation, March 27, 167 p.
Orvana Minerals Corp., 2002, Progress report on construction of the Don Mario mine and financial results for third quarter of 2002: Toronto, Ontario, Canada, Orvana Minerals Corp. News Release, November 21, 5 p.
U.S. Commercial Service, 2004, Bolivian mining industry 2003: La Paz, Bolivia, U.S. Commercial Service and U.S. Department of State, U.S. Embassy, April 1, 18 p.

Internet References Cited

Actis Capital LLP, 2002 (June 6), CDC Capital Partners' joint venture acquires RBG's Bolivian tin assets, accessed January 25, 2005, at URL http://www.act.is/press/releases/pr_colquiri.asp.
Amcham Bolivia, 2004, Mining, Investment Outlook, accessed December 2004, at URL <http://www.amchambolivia.com/bolivia.php>.
BG Group Plc., 2004, Bolivia-Brazil Pipeline (BBP), Brazil—Exploration, accessed December 2004, at URL <http://www.bg-group.com/international/int-brazil.htm#bbp>.
Bocangel, Danilo, 2001 (August), Small-scale mining in Bolivia, National Study of Mining Minerals and Sustainable Development, No. 71, accessed December 2004, at URL http://www.iied.org/mmsd/mmsd_pdfs/asm_bolivia_eng.pdf.
Fondo Latinoamericano de Reservas, 2003 (March), Bolivia—March 2003, accessed September 10, 2003, at URL http://www.flar.net/bancoconocimiento/M/MacroeconomicReportBolivia/Bolivia_Macro.pdf.
Instituto Nacional de Estadística, 2004a (August), Inversión extranjera directa 1996-2002, accessed December 2004, at URL <http://www.ine.gov.bo/pdf/ied/ied.pdf>.
Instituto Nacional de Estadística, 2004b (October), Section 3.04, Anuario Estadístico 2003, accessed December 2004, via URL http://www.ine.gov.bo/PDF/Anuario_2003/Anuario_2003.pdf.
Instituto Nacional de Estadística, 2004c (October), Section 4.02, Anuario Estadístico 2003, accessed December 2004, via URL http://www.ine.gov.bo/PDF/Anuario_2003/Anuario_2003.pdf.
Instituto Nacional de Estadística, 2004d (October), Section 5.01, Anuario Estadístico 2003, accessed December 2004, via URL http://www.ine.gov.bo/PDF/Anuario_2003/Anuario_2003.pdf.
Instituto Nacional de Estadística, 2005 (January), Estadísticas de la actividad minera 1993-2003, accessed January 2005, at URL http://www.ine.gov.bo/PDF/Mineria/Minera_93-03.pdf.
International Monetary Fund, 2003a (April), Bolivia—Gross domestic product—Current prices, 1970-2003, World Economic Outlook Database, accessed December 2004, at URL http://www.imf.org/external/pubs/ft/weo/2003/01/data/ngdpgd_a.csv.
International Monetary Fund, 2003b (April), Bolivia—Per capita gross domestic product—Current prices, 1970-2003, World Economic Outlook Database, accessed December 2004, at URL http://www.imf.org/external/pubs/ft/weo/2003/01/data/d_pc_a.csv.
Simpson, Robert, 2004, E-Research report on Golden Eagle International Inc., accessed January 2005, at URL <http://www.geii.com/downloads/EResearchFinal.pdf>.
U.S. Central Intelligence Agency, 2002, Bolivia, World Factbook 2002, accessed January 1, 2003, at URL <http://www.odci.gov/cia/publications/factbook/geos/bl.html>.
U.S. Department of Energy, 2003, An energy overview of Bolivia, accessed December 2004, at URL <http://www.fe.doe.gov/international/Western%20Hemisphere/bolvover.html>.
U.S. Embassy, La Paz, Bolivia, 2003 (December), Bolivia, National Trade Estimate Report, accessed December 2004, at URL <http://www.megalink.com/usemblapaz/commercial/NationalTradeReport.pdf>.
U.S. Energy Information Administration, 2002, Bolivia, Country Analysis Brief, accessed September 29, 2002, at URL <http://www.eia.doe.gov/emeu/cabs/bolivia.html>.
Yacimientos Petrolíferos Fiscales Bolivianos, 2003, Summary of the Vice President of International Negotiations and Contracts (VPNC) in 2002, accessed February 3, 2005, at URL <http://www.ypfb.gov.bo/infom2002/DIC2002/AN1202.htm>

Major Sources of Information

Vice Ministerio de Minería y Metalurgia

Ave. Mariscal Santa Cruz

Palacio de Comunicaciones Piso 14

La Paz, Bolivia

Telephone: (591-2) 371165

Fax: (591-2) 359998

Asociación Nacional de Mineros Medianos,

Calle Pedro Salazar No. 600

Casilla 6190

La Paz, Bolivia

Telephone: (591-2) 417522

Fax: (591-2) 414123

Camara Boliviana de Hidrocarburos,

Radial 17 1/2 6to. Anillo, Zona Oeste

Santa Cruz de la Sierra, Bolivia

Telephone: (591-3) 538799

Fax: (591-3) 577868

Major Publications

Ministerio de Desarrollo Económico, Viceministerio de Minería y Metalurgia, La Paz:

Boletín Estadístico 2002

Publicación Oficial No. 194

Asociación Nacional de Mineros Medianos: Memoria e Informe Anual 2002

Camara Boliviana de Hidrocarburos: Petróleo & Gas Magazine, bimonthly publication.

TABLE 1
BOLIVIA: PRODUCTION OF MINERAL COMMODITIES¹

(Metric tons unless otherwise specified)

Commodity ²	1998	1999	2000	2001	2002 ^p
METALS³					
Antimony:					
Mine output, Sb content	4,735	2,790	1,907	2,264	2,336
Metal including Sb content of trioxide	3,836	2,241	1,285	1,992	195
Arsenic, mine output, arsenic trioxide, arsenic sulfide	284	437	318	846	237
Bismuth:					
Mine output, Bi content	1,032	708	75 ^e	60	70
Metal, smelter	83	57	6	66	20
Copper, mine output, Cu content	48	252	110	18	3
Gold, mine output, Au content ⁴ kilograms	14,444	11,788	12,001	12,395	11,256
Lead:					
Mine output, Pb content	13,848	10,153	9,523	8,857	9,893
Metal, smelter, primary	65	45	251	106	947
Silver:					
Mine output, Ag content kilograms	404,000	422,492	433,592	408,000	450,311
Refined ⁵ do.	1,157,954	72,195	55,720	32,603	31,871
Tantalum, tantalite do.	15,624	8,808	9,443	11,992	10,823
Tin:					
Mine output, Sn content	11,308	12,417	12,464	12,298	15,242
Metal, smelter	11,102	11,166	9,353	11,292	10,876
Alloys	160	75	217	139	257
Tungsten, mine output, W content	497	334	382	533	400
Zinc, mine output, Zn content	152,110	146,316	149,134	141,226	141,558
INDUSTRIAL MINERALS					
Arsenic trioxide	284	437	318	846	237
Barite	2,500	6,005	3,050	6,253	1,556
Bentonite	50 ^e	50 ^e	--	159	216
Cement, hydraulic	1,166,511 ^r	1,201,274 ^r	1,071,941 ^r	982,543 ^r	1,010,446
Gemstone, amethyst:					
Polished ^e kilograms	21 ⁶	20	20	20	--
Rough do.	140	314	320	65	--
Marble	250	468	673	374	374
Quartz kilograms	31	36	--	7	3
Salt	562	688	327	308	3,834
Slate, pizarra	484	198	269	246	306
Ulexite	7,026	15,362	41,021	32,477	33,053
MINERAL FUELS AND RELATED MATERIALS					
Gas, natural:					
Gross ^e million cubic meters	3,106 ^r	2,612 ^r	3,598 ^r	5,275 ^r	6,421 ^r
Marketed do.	3,426	3,396	3,398	4,870 ^e	2,900 ^e
Natural gas liquids:^e					
Natural gasoline thousand 42-gallon barrels	3,000	3,000	3,000	3,000	3,000
Other, consumption do.	2,600	2,600	2,600	3,000	3,000
Petroleum:					
Crude including condensate do.	12,628 ^r	10,680	10,107 ^r	11,424 ^r	11,338 ^r
Refinery products:^e					
Liquefied petroleum gas do.	730 ⁶	700	720	720	750
Gasoline do.	4,015 ⁶	3,700	3,690	3,700	3,700
Jet fuel do.	1,095 ⁶	1,000	1,100	1,100	1,115
Kerosene do.	365 ⁶	400	400	400	400
Distillate fuel oil do.	2,920 ⁶	3,000	3,000	3,100	3,100
Residual fuel oil do.	365 ⁶	200	200	210	220
Unspecified do.	5,110 ⁶	4,200	4,500	4,400	4,400
Total do.	14,600 ⁶	13,200	13,600	13,600	13,685

See footnotes at end of table.

TABLE 1--Continued
BOLIVIA: PRODUCTION OF MINERAL COMMODITIES¹

⁶Estimated; estimated data are rounded to no more than three significant digits, ⁸Preliminary. ⁵Revised. -- Zero.

¹Table includes data available through July 29, 2003.

²In addition to the commodities listed, a variety of industrial minerals (clays, crushed and broken stone, dimension stone, and sand and gravel) are produced, but available information is inadequate to make reliable estimates of output levels.

³Unless otherwise specified, data represent actual production by Corporación Minera de Bolivia and small- and medium-sized mines.

⁴Includes production of metallic gold.

⁵Includes production of metallic silver.

⁶Reported figure.